IN THE CLAIMS:

1.   (currently amended) A method for operating a facility having a plurality of equipment combinations, each equipment combination is operable interactively with at least one other equipment combination, said method comprising:

receiving a plurality of measured process parameters, in real-time, for each of the plurality of equipment combinations, a plurality of measured process parameters wherein the equipment combinations include at least a driver machine and a driven machine;

determining at least one derived quantity from the plurality of measured process parameters; and

recommending a change to an equipment operation based on the measured process parameters and the derived quantities.

2.   (currently amended) A method in accordance with Claim 1 wherein receiving a plurality of measured process parameters, in real-time, for each of the plurality of equipment combinations and for the at least one individual piece of equipment further comprises receiving measured process parameters intermittently.

3.   (original) A method in accordance with Claim 1 wherein determining at least one derived quantity comprises determining at least one derived quantity in real-time.

4.   (original) A method in accordance with Claim 1 wherein determining at least one derived quantity comprises:

receiving measured process parameters associated with each of the derived quantities; and

determining each of the derived quantities using at least one rule from a rule set.

5.   (original) A method in accordance with Claim 1 further comprising generating a rule set for an equipment combination using at least one of the measured process

parameters, the derived quantities, a design specification for the equipment combination, a maintenance history of the equipment combination, and an expert database.

6.   (original) A method in accordance with Claim 1 further comprising receiving technical information from an online interactive technical manual for at least one equipment combination.

7.   (original) A method in accordance with Claim 1 further comprising receiving measured process parameters from a remote input/output device.

8.   (original) A method in accordance with Claim 1 further comprising receiving measured process parameters from a portable data logger.

9.   (original) A method of analyzing the health of an equipment combination operating in a system that includes a plurality of other equipment combinations coupled to the equipment combination through conduits, and wherein the equipment combination includes a driver machine and a driven machine coupled in rotational synchronicity, said method comprises:

receiving a measured process parameter associated with the driver machine;

receiving a measured process parameter associated with the driven machine;

receiving at least one measured process parameter associated with the plurality of other equipment combinations; and

deriving a process parameter quantity for at least one of the measured process parameter associated with the driver machine and the measured process parameter associated with the driven machine using the at least one measured process parameter associated with the plurality of other equipment combinations.

10.   (original) A method of analyzing the health of an equipment combination in accordance with Claim 9 wherein deriving a process parameter quantity comprises deriving a process parameter quantity for a parameter that is not instrumented.

11. (original) A method of analyzing the health of an equipment combination in accordance with Claim 9 wherein deriving a process parameter quantity comprises deriving a process parameter quantity for a parameter that is measured by at least one process sensor wherein the derived process parameter quantity is compared to a respective measured process parameter to verify an operability of the at least one sensor.

12. (original) An integrated monitoring and control system for a plant wherein the plant has a plurality of equipment combinations that are operable interactively with each other and with individual equipment and wherein the combinations are operable to maintain selected plant operational conditions, said monitoring and control system comprising:

a plurality of sensors operatively coupled to the equipment combinations, the plurality of sensors measuring process parameters for monitoring plant operation and assessing equipment combination condition, and providing output signals to said monitoring and control system, wherein each equipment combination includes at least a driver machine and a driven machine;

a derived quantity layer communicatively coupled to a data bus, said derived quantity layer configured to:

receive the measured process parameters; and

compute values for process parameters using the measured process parameters;

a rule set layer comprising at least one rule associated with at least some of the plurality of equipment combinations for determining a health of the equipment combination; and

a recommendation layer for correlating the health of the equipment combination to at least one of a mitigating procedure, a maintaining procedure, and an operation procedure.

13. (original) An integrated monitoring and control system for a plant in accordance with Claim 12 further comprising a communications layer for sampling said sensor output signals communicatively coupled to the output signals.

14.   (original)   An integrated monitoring and control system for a plant in accordance with Claim 13 wherein said communications layer is configured to receive network message packets of sensor output data.

15.   (original)   An integrated monitoring and control system for a plant in accordance with Claim 13 wherein said communications layer is configured to preprocess said sensor output signals.

16.   (original)   An integrated monitoring and control system for a plant in accordance with Claim 12 further comprising a display layer configured to generate graphical representations of measured process parameters and derived quantities.

17.   (original)   An integrated monitoring and control system for a plant in accordance with Claim 16 wherein said display layer is configured to generate graphical representations of measured process parameters and derived quantities in at least one of real-time, historical values, and a combination of real-time and historical values.

18.   (original)   An integrated monitoring and control system for a plant in accordance with Claim 12 wherein said mitigating procedure includes selectable control actions that are determined from a rule for at least one of facilitating reducing damage to equipment from an equipment failure, and maintaining the plant in an overall operational condition.

19.   (original)   An integrated monitoring and control system for a plant in accordance with Claim 12 wherein said maintenance procedure includes maintenance actions that are determined from a rule for at least one of facilitating reducing an equipment outage time, increasing an equipment combination availability, and facilitating reducing equipment combination failure.

20.   (original) A computer program embodied on a computer readable medium for monitoring a plant, the plant having a plurality of equipment combinations operating interactively with each other and with individual equipment, said program comprising a code

segment that controls a computer that receives a plurality of process parameters from sensors operatively coupled to the equipment combinations and individual equipment and then:

derives values for process parameters using the measured process parameters;

selects a rule from a set of rules comprising a plurality of commands that direct data analysis for each at least one of measured process parameter, a derived quantity, a plurality of measured process parameters and a derived quantities associated with an equipment combination; and

recommends at least one of a mitigating procedure, a maintaining procedure, and an operation procedure.

21.   (original)   A computer program in accordance with Claim 20 directs the computer to receive a plurality of process parameters from a portable data collector.

22.   (original)   A computer program in accordance with Claim 20 directs the computer to receive a plurality of process parameters from an online process monitor.